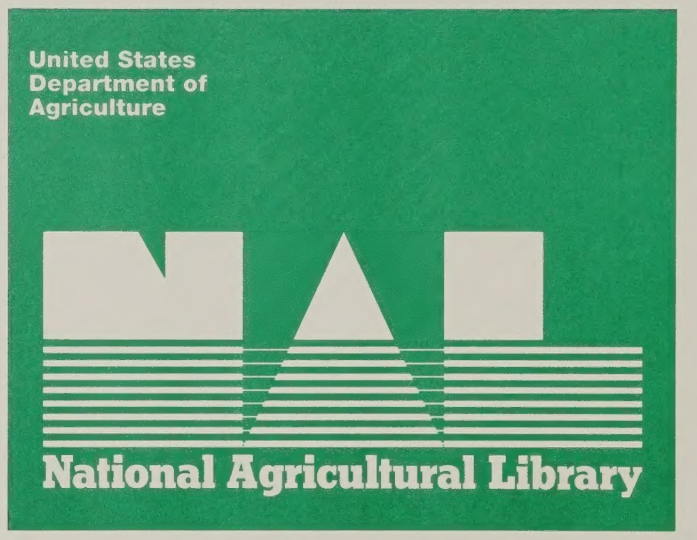
Forest Health Restoration Initiative

Southwestern
Region

"Our Choice to Make"



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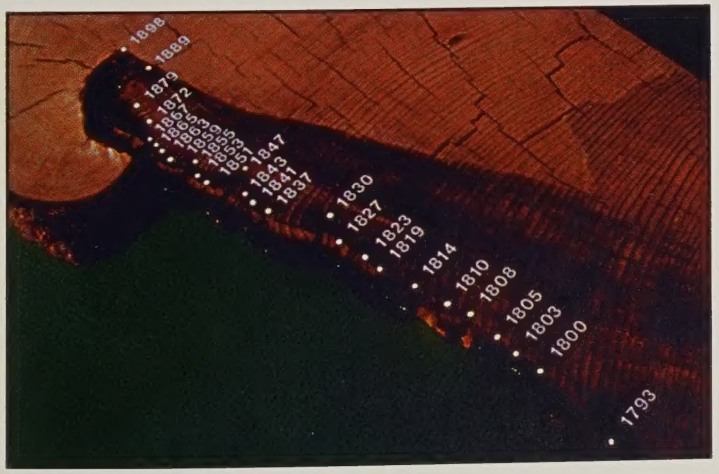
Forest Health Restoration Initiative Overview

The varied topography and climate in the Southwest has resulted in complex ecosystems of ponderosa pine, mixed conifer, aspen, spruce-fir, woodland, chapparal, and riparian areas. The structure and the composition of these ecosystems on National Forest Service lands have changed significantly since European settlement in response to both management activities and climatic events such as periodic droughts. A decline in forest health has resulted from these rapid changes, indicated by the increased incidence of insect and disease infestations, widespread potential for high intensity wildfires, loss of habitat diversity, and a decrease in the resiliency of these ecosystems. An accelerated effort is needed to restore overall forest health so that anticipated disturbance events such as drought, fire, or insect outbreaks, fall within the ability of the various ecosystems to absorb and thereby maintain their biological integrity.

Historic Condition

Reports from early travelers described forests in the Southwest as having an open, park-like appearance.



In ponderosa pine, fires would occur at intervals usually averaging less than 10 years and as often as every 2 years.

Pre-settlement fires occurred on a regular basis in all forest types:

Species	Frequency
Ponderosa Pine	2-10 years
Mixed Conifer	5-25 years
Spruce/Fir	150+ years
Piñon-Juniper	10-30 years
Chaparral	30-100 years

Because frequent fires kept the understory from building up, historic fires were typically low intensity ground fires.

Current Situation

Ecosystems containing timberland, woodland, and chapparal comprise approximately 16.3 million acres of National Forest lands in New Mexico and Arizona. Over time, the ecological condition of our forests has been altered resulting in increased susceptibility to drought, insects and disease, and intense wildfires.

The Structure Of Our Forests Is Changing

In all forest types, stands are becoming much denser than had been recorded at the turn of the century. Just over the last thirty years, the number of trees per acre has increased 21% on National Forest lands in Arizona and New Mexico. The reduction in the competitive ability of the herbaceous understory and meadow species, the suppression of low intensity wildfires, combined with the logging of large diameter trees, allowed smaller diameter trees to grow into dense stands over much of the landscape. In ponderosa pine forests, heavy grazing practices since before the century removed vegetation competing with pine seedlings. Overgrazing, combined with fire control and some unusually heavy seed crop years, produced dense thickets of young pines—a significant departure from the open park-like appearance of historical pine forests. Openings in the forest have either decreased or been lost altogether. Mixed conifer forests have filled in meadows.

The structure of our forests is changing. Dense sapling thickets of young pine regeneration have become common over large areas.

Most of our mixed conifer stands have not burned for over 100 years and also have become more dense. The denser forest stands have resulted in a continuous decline in naturally occurring grasses and forbs.

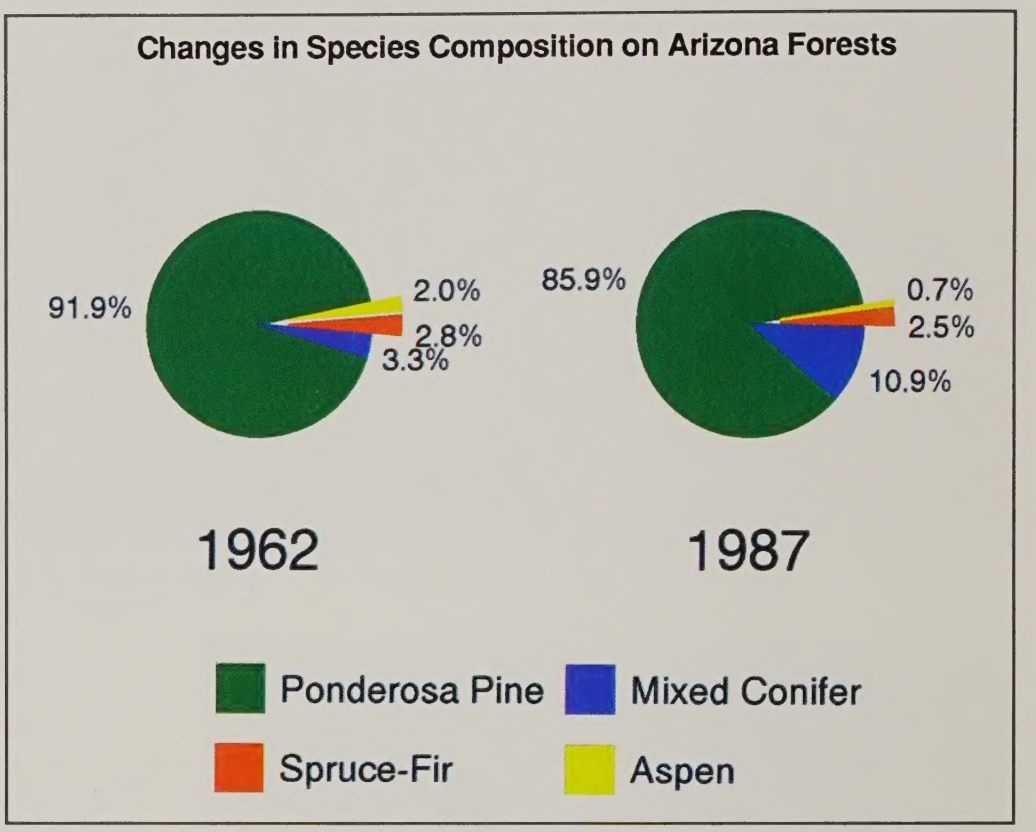
Openings in the forest have either decreased or been lost altogether.

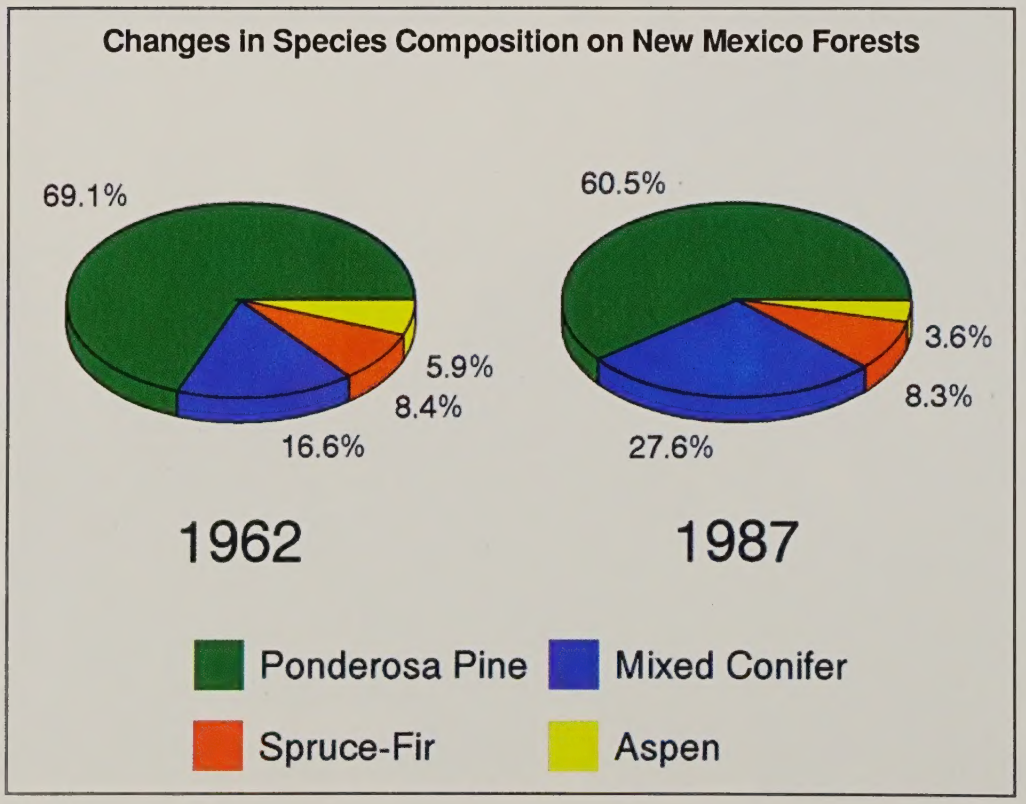
Almost all meadows in the mixed conifer zone show evidence of conifer invasion at their margins.

As canopies close, we are losing rare species, such as this orchid.

The Composition Of Our Forests Is Changing

Forest inventories show a rapid change occurring in species composition. Since 1962, the acreage of mixed conifer has more than doubled, while the acreage of aspen has declined by almost one half. In both ponderosa pine and aspen, conifer understories are present. Since ponderosa pine and aspen are unable to regenerate under shaded conditions, these stands will be replaced by conifers over time.





In some areas, the natural regeneration of ponderosa pine understory is being replaced by a mixed conifer understory.

Conifers replace aspen stands if aspen is not regenerated. The acres where aspen is predominate have declined by over one-half in the last 30 years.

Effects Of These Changes

The ultimate response to these rapid changes has been a deterioration in forest ecosystem health. As both the structure and the successional stages of the forest have become less diverse, the quality of wildlife and fish habitat has declined, adversely affecting many threatened, endangered, and sensitive plant and animal species. The denser forest stands and the buildup of fine debris on the forest floor has resulted

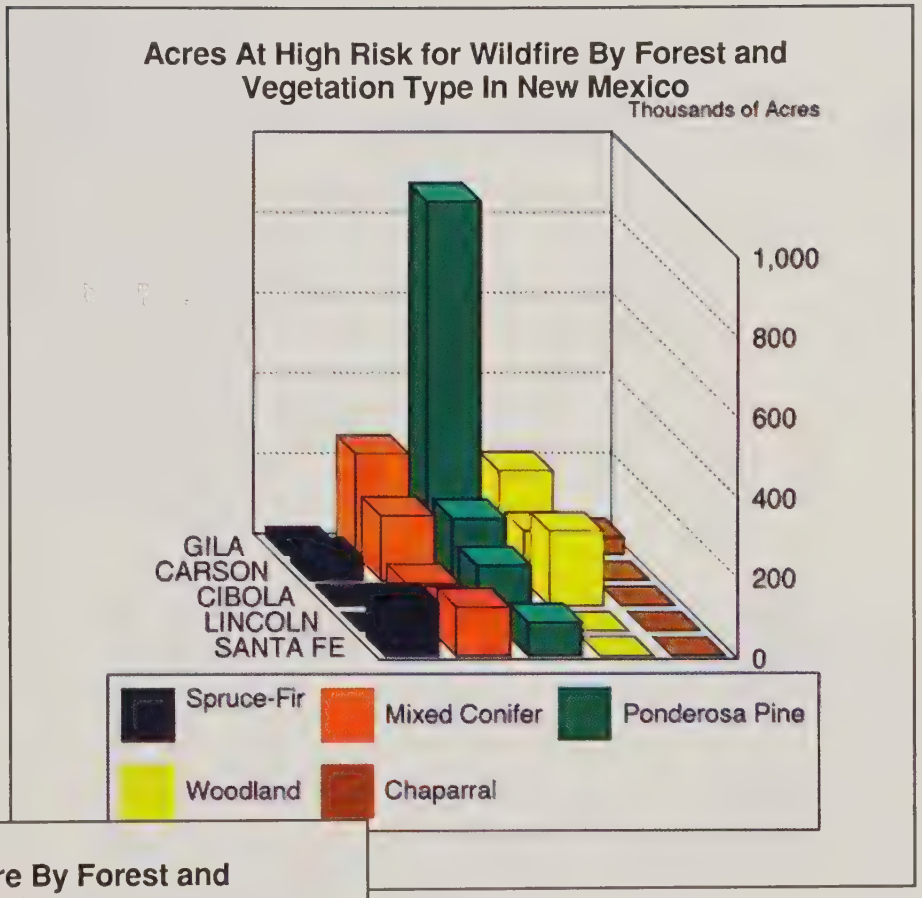
Changing forest conditions have decreased the resilience of ecosystems to absorb anticipated disturbance events such as drought. This picture was taken during a drought on the Kaibab National Forest in 1989.

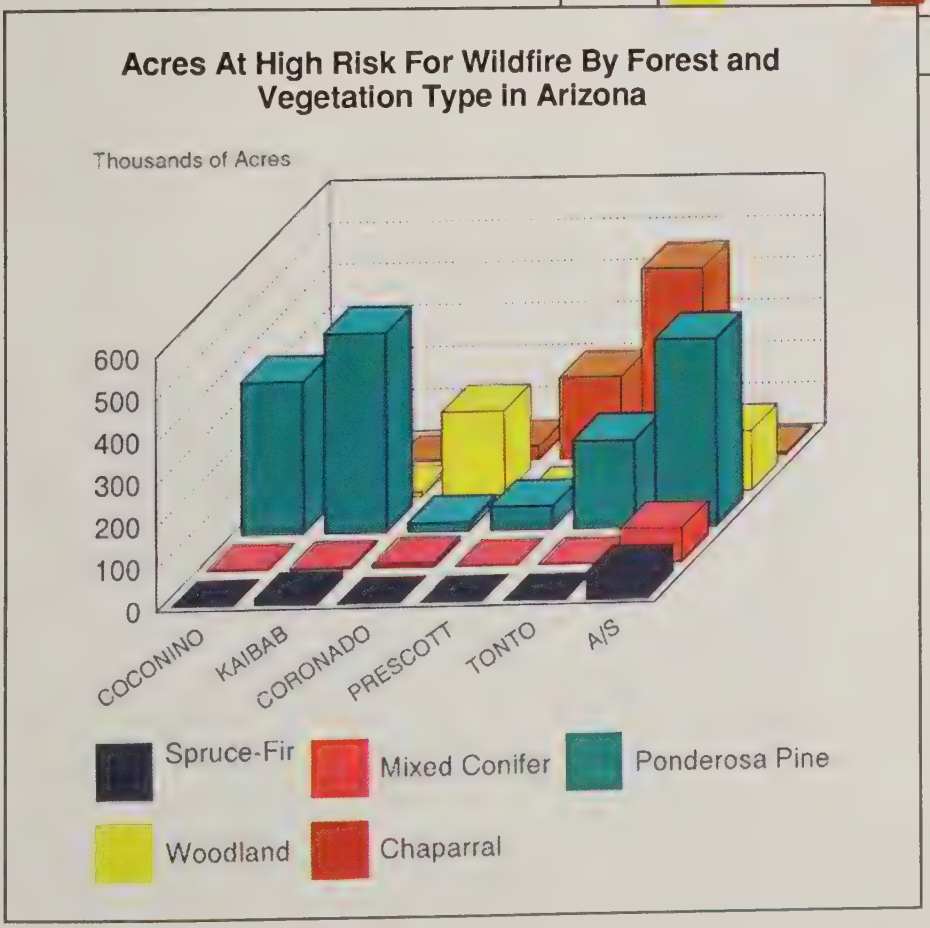
High intensity fires result in increased erosion and degraded soil condition.

Denser forest stands and buildup of debris on the forest floor have increased the risk of large catastrophic fires.

in a continuous decline in naturally occurring grasses and forbs, and decreased the regeneration potential for aspen and ponderosa pine. These conditions have also decreased the resilience of our forests to drought. Over the centuries, Southwestern forests have evolved to tolerate periodic drought, but the increased stress from overcrowded trees is causing mortality during dry periods. The situation can be likened to a group of peole sharing a canteen in the desert—while three people may have enough water in the canteen to survive for three days, ten people sharing the same amount of water may perish.

Over the last few decades, there has been a steady increase in wildfire intensity. With the suppression of the frequent natural low-intensity fires of the past that cleared the forest floor,





today's wildfires are becoming increasingly difficult to control. Approximately 5.5 million acres are considered at a high risk for high intensity fires because of dense conditions and a buildup of debris on the forest floor, with over 224,000 homes in or adjacent to Forest Service land at risk for wildfire. Severe fires damage the soil and contribute to increased erosion.

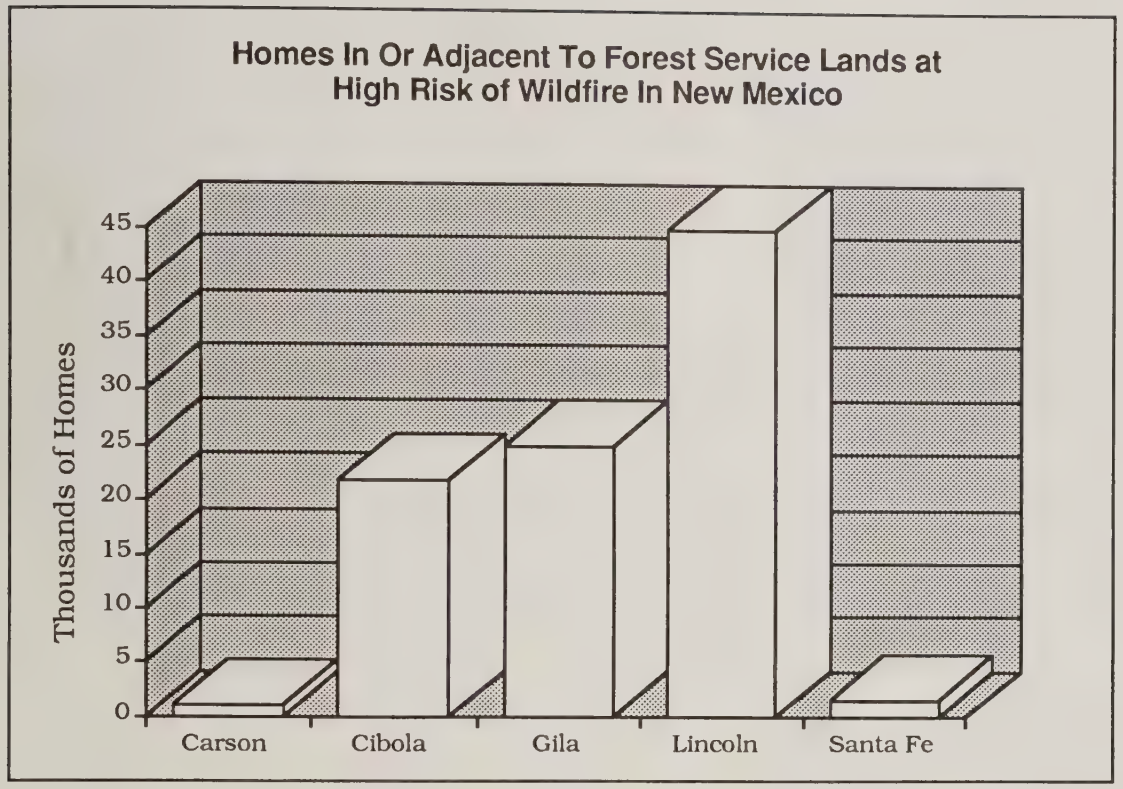
In recent decades, there have been higher levels of insect and disease infestations, and current conditions increase the risk of large scale outbreaks. The incidence of dwarf mistletoe, for instance, has increased over the last thirty years in all Southwestern forests except one. There has been a dramatic increase in the acres infested with western pine beetles. Recent

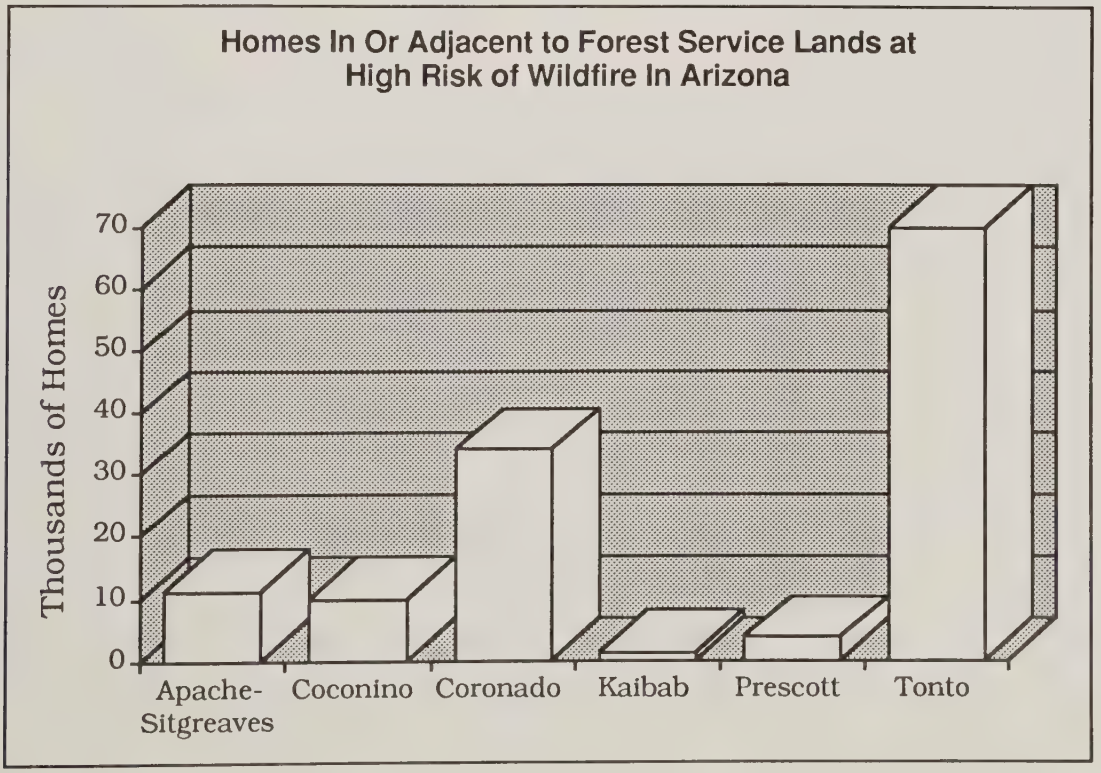
outbreaks of spruce budworm have become more synchronous, suggesting that they are more extensive than previous outbreaks. As ponderosa pine is replaced by firs, which are much more prone to infection by root disease, the incidence of root disease is expected to increase.

Repeated defoliation from spruce budworm outbreaks can eventually result in mortality, particularly of trees stressed by other factors. This picture was taken of the Red River drainage, Carson National Forest.

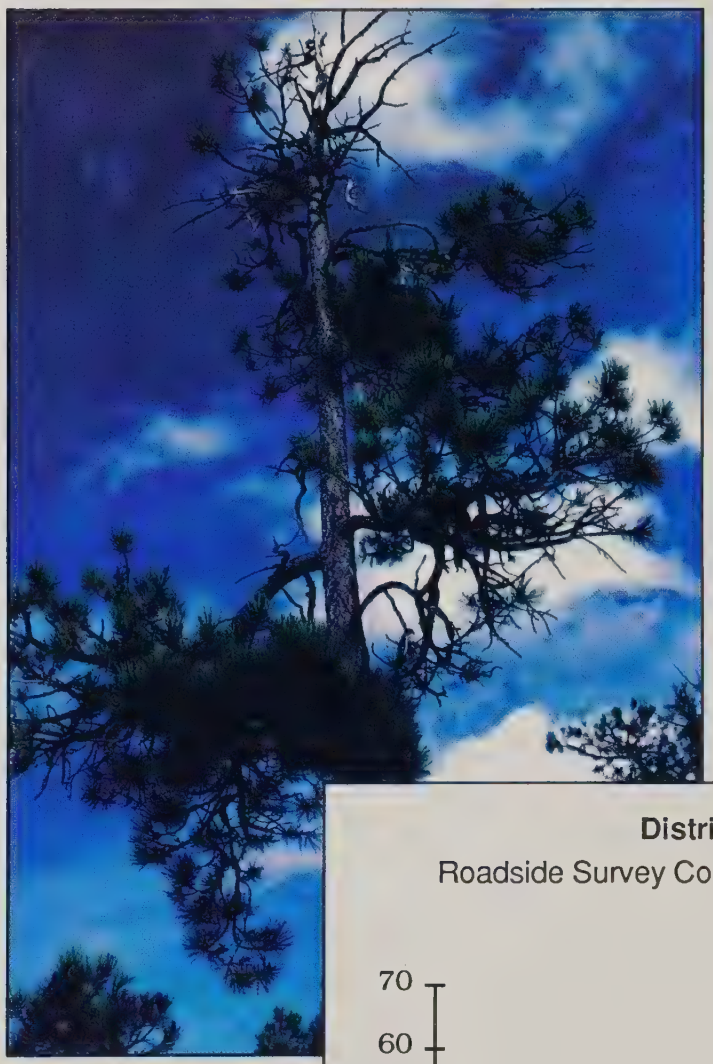
Over 224,000 homes are at high risk for wildfire in the Southwestern Region.

More and more homes are being built within or adjacent to Forest Service lands.


Homes In Or Adjacent To Forest Service Lands at
High Risk of Wildfire In New Mexico
Thousands of Homes
0
5
10
15
20
25
30
35
40
45
Carson
Cibola
Gila
Lincoln
Santa Fe


Homes In Or Adjacent to Forest Service Lands at
High Risk of Wildfire In Arizona
Thousands of Homes
0
10
20
30
40
50
60
70
Apache-
Sitgreaves
Coconino
Coronado
Kaibab
Prescott
Tonto

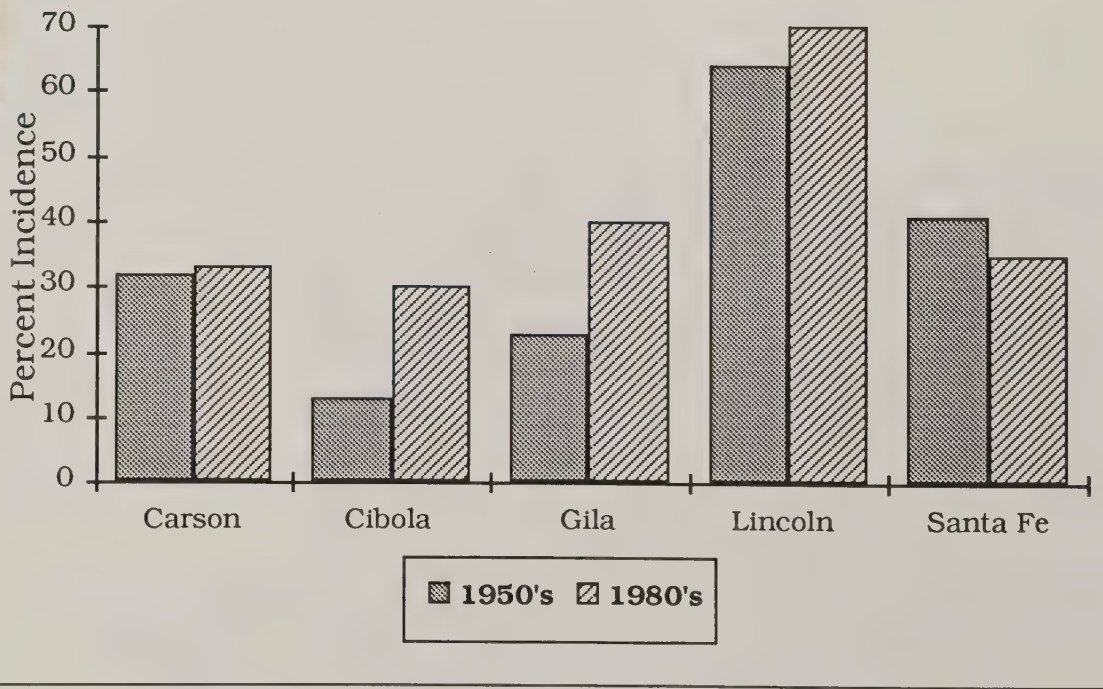
It Is Likely That The Incidence Of Dwarf Mistletoe Has Been Increasing Over Time

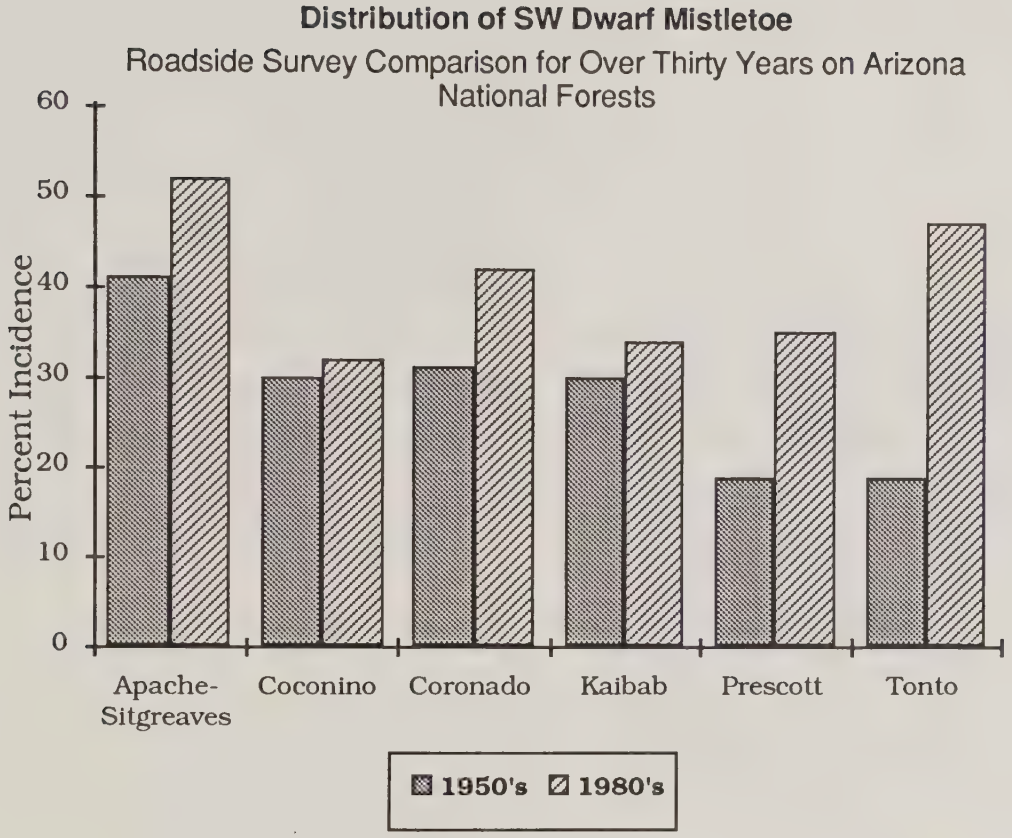


Dwarf mistletoes are the most wide-spread disease-causing agents in the Southwest. They slowly weaken and eventually kill the host tree.

Distribution of SW Dwarf Mistletoe

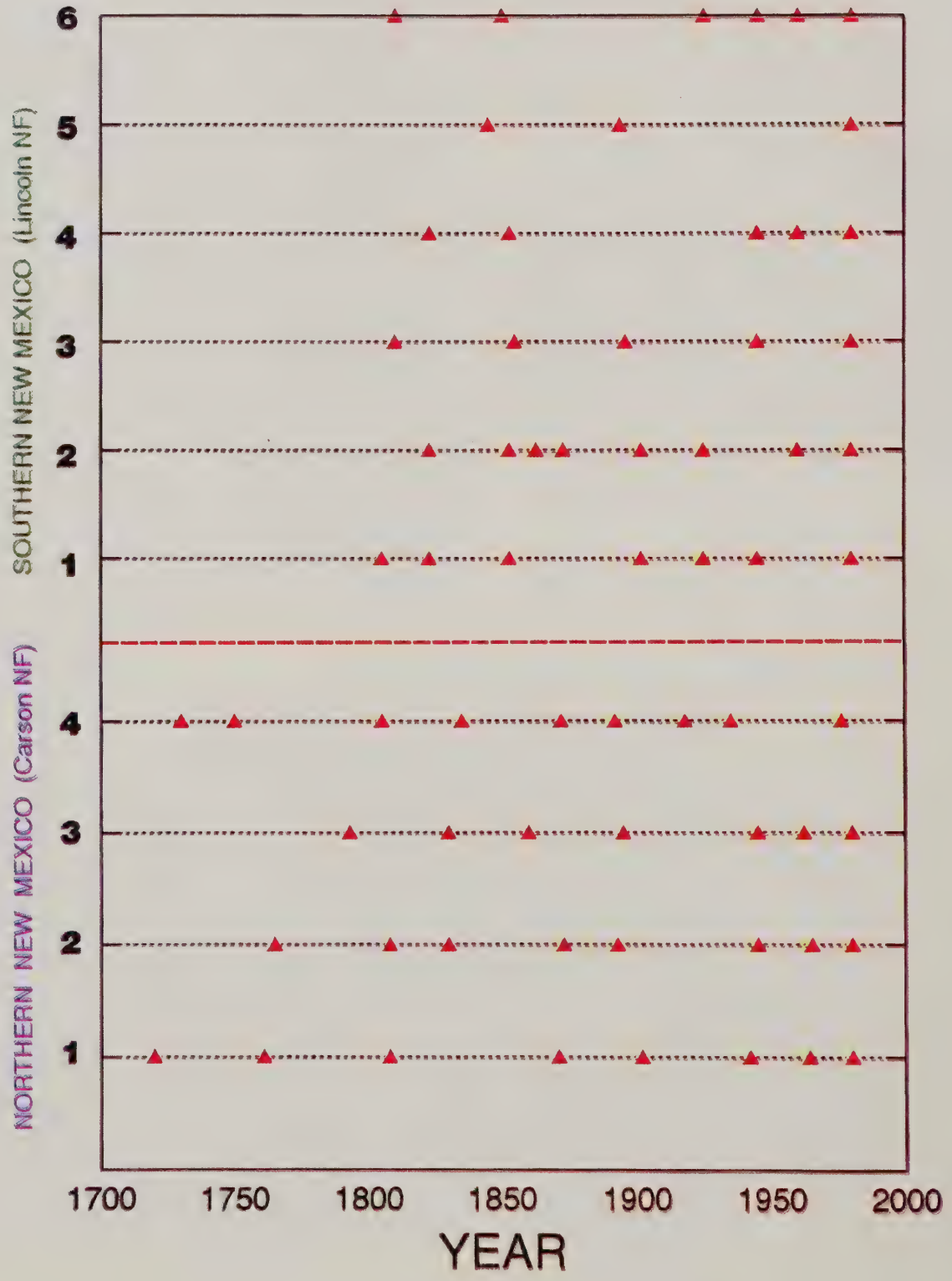
Roadside Survey Comparison for Over Thirty Years on New Mexico National Forests





Bark beetle outbreaks occur in unhealthy forest conditions, i.e., high stand densities and highly stressed host trees. When outbreaks occur, they can kill vast numbers of trees over very large areas, and set the stage for devastating fires.

Budworm Outbreaks Have Become More Synchronous Over A Large Area Of The Southwest Since 1900



Other Forest Health Problems

Healthy forest conditions help insure stable watersheds with more reliable water yields and a high quality of water. Current conditions in watersheds and riparian areas need improvement, as many acres of riparian areas do not meet Forest Plan objectives, miles of channels are unstable, and compacted and eroding soils occur in some forest ecosystems. Restoring health in the forest ecosystem by mimicking natural processes will provide opportunities to improve forage, habitat diversity for fish and wildlife species, quality of recreation, and ecosystem resilience, as well as to provide wood products, contribute to community stability, reduce the risk of destructive fires, and obtain more naturally occurring levels of insects and disease.

Deteriorating soil conditions occur in some forested ecosystems, particularly woodlands.

Many acres of riparian areas do not meet Forest Plan objectives. Many miles of channels are unstable.

Desired Condition

Forest Health Restoration Initiative

What are we trying to achieve?

- Taking an ecological approach to multiple-use management to restore health in forest ecosystems.
- Restoring the resilience of forest ecosystems to natural stresses.
- Decreasing the risk of destructive fires, particularly in the urban-woodland interface.
- Modify vegetation conditions to reduce potential damages caused by insects and disease.
- Managing with a sensitivity to lifestyle as well as ecosystem needs.
- Achieving a desired mosaic of vegetation conditions across the landscape.

By mimicking natural processes, an array of successional conditions across landscapes (i.e., a mosaic) can be maintained, to provide for diversity of composition, structure, and ecological functions.

Restoring the health and productivity of our woodland ecosystems, with management that is sensitive to lifestyle as well as ecosystem needs, will improve biological diversity, water quality and availability, and wildlife habitat, as well as providing products to local communities.

A more open canopy improves the abundance and vigor of grasses and forbs. The desired mosaic will include a variety of conditions ranging from open areas to dense clumps.

Riparian vegetation makes up less than 2 percent of the landscape in the Southwest. Healthy riparian areas provide essential habitat for terrestrial wildlife and aquatic life.

Implementing the Forest Health Restoration Initiative

Over a million acres of Forest Service land in the Southwest could be treated to restore forest health over the next five years. Much of the treatment will be thinning and prescribed burning. Emphasis in the prescribed burning program will be in urban interface areas which are more costly to treat. Specific treatment actions will be determined using an ecological approach to multiple-use management to implement Forest Land Management Plans on each forest.

Prescribed burning is one management technique that can be effectively used to thin stands, create openings, reduce the level of debris on the ground, improve the reproduction of grasses and forbs, and regenerate aspen.

Thinning, particularly small diameter trees, is another management technique that can be used to improve the diversity and health of forest ecosystems.

An unthinned area on the Mountainair Ranger District. Crowding stresses trees and makes them less able to withstand anticipated disturbances such as fire, drought, or insect outbreaks.

The same project area on the Mountainair Ranger District after thinning.

Techniques to leave debris on the ground, such as lopping and scattering and piling, provide a micro-habitat for grasses, enhance moisture, and provide organic material to the soil.

Thinning improves ecosystem health—less crowding results in improved vigor and ability to maintain foliage. In this example, the debris was left on the ground to provide shade and moisture.

Thinning can be used to create fuelbreaks to protect homes in or adjacent to Forest Service lands.

Openings in the forest catch snow and can increase water yield. Maintaining existing openings and creating openings in areas with an unbroken canopy can also result in improved forage and habitat diversity.

Aspen reproduce almost exclusively by suckering produced when the overstory is removed or dies. Creating openings using silvicultural techniques or burning regenerates aspen stands.

Additional protective measures, such as fencing or locating salt and water to draw animals away, may be required for a few years to allow suckers to become established.

Potential Partners

New Mexico

New Mexico Department of Agriculture

State Land Department

State Forestry

State Game and Fish Department

University of New Mexico

Other Federal Land Management Agencies: National Park Service, Bureau of Land Management, Bureau of Indian Affairs

Soil Conservation Districts

New Mexico State University

Environmental Community: Sierra Club, The Nature Conservancy, Audubon Society, Wilderness Society

Professional Organizations: Society of American Foresters, Wildlife Society

Sikes Act Committee

New Mexico Environment Department

Forest Service Research

U.S. Fish and Wildlife Service

Congressional Offices

USDA Extension Service

Native American Tribal Governments

Alliance for the West

Arizona

State Game and Fish Department

State Land Office

State Forestry

Arizona Conservation Corps

Universities: Northern Arizona University, Arizona State University, University of Arizona

Other Federal Land Management Agencies: National Park Service, Bureau of Land Management, Bureau of Indian Affairs

Soil Conservation Service

Arizona Department of Environmental Quality

Environmental Community: Sierra Club, The Nature Conservancy, Audubon Society, Wilderness Society

Professional Organizations: Society of American Foresters, Arizona Wildlife Federation, Soil and Water Conservation Society

Arizona Riparian Council

Natural Resource Conservation Districts

Resource Conservation and Development

U.S. Fish and Wildlife Service

Congressional Offices

USDA Extension Service

Native American Tribal Governments

Northern Arizona Council of Governments

Forest Service Research

Industry: Stone Container Corporation, Kaibab Forest Industries, Precision Pine

Rocky Mountain Elk Foundation

Arizona Commission on the Environment